AMENDMENT TO THE SPECIFICATION

Please amend the specification by deleting the text that was added to the specification after Table 12 on page 31 and which reads as follows (and is struck-through):

~~Further analysis of certain samples was performed to determine lattice parameters using the following equipment at the following operating conditions: The samples were in powder form and were prepared for analysis by adding a small amount of NIST (National Institute of Standards and Testing) silicon metal powder. The NIST silicon metal powder is a certified standard material that is used to correct the peak position calculations for errors in instrument alignment. This powder blend, i.e., the powder blend of the sample powder and the NIST silicon metal powder, was mixed with an organic binder and acetone to form a slurry. The resulting slurry was affixed to a glass slide and then allowed to dry.~~

~~Diffraction data was collected using standard Braggs optics minimized for peak resolution. Data was collected using as a minimum a 0.008 degrees step in the range of 75 degrees to 135 degrees. These step positions were selected so as to maximum the accuracy of the peak position determination. Data was collected for four seconds at each step. Collected diffraction data was first corrected for instrument error using the NIST silicon reference pattern. Precise diffraction peak positions were determined by fitting a pseudo-Voight function to the collected data. Lattice parameters for each of the SiAlON phases were determined from the peak positions by using a "least squares" method. The resultant parameter errors are set forth in parenthesis for the alpha prime SiAlON phase and the beta prime SiAlON phase of each example.~~

~~Table 13 below sets forth the results of these lattice parameter measurements where these lattice parameters measurements have an error of ± .0001, except where indicated by an asterisk (*) that shows no error in the measurement.~~

~~Table 13~~

~~Results of Lattice Parameter Measurement for Samples 982, 1145A, 1145B and 1374D~~

~~Sample~~	~~Beta Silicon Nitride Content~~	~~Alpha Lattice Parameter 'a'~~	~~Alpha Lattice Parameter 'c'~~	~~Beta Lattice Parameter 'a'~~	~~Beta Lattice Parameter 'c'~~	~~X Value~~	~~m Value (3-x)~~	~~z Value~~

	(wt.%)							
1145A	6%	7.7977	5.8759	7.6204	2.9198[a]	0.354	1.063	0.478
1145B	2%	7.7928	5.8714	7.6203	2.9201[a]	0.321	0.963	0.487
982	1.5%	7.7927	5.6706	7.6201	2.9197	0.319	0.957	0.475
1374D	0%	7.7875	5.6665	7.6223	2.9215	0.287	0.860	0.542

Table 14 below sets forth the content of the alpha SiAlON phase in weight percent of the two phase composite (i.e., the alpha SiAlON phase and the beta SiAlON phase), the formula of the alpha SiAlON phase, and the ytterbium content (in moles) contained in the grain boundary for the four samples of Table 13.

Table 14

The Content of Alpha SiAlON Phase in the Two-Phase Composite, the Formula of the Alpha SiAlON Phase and the Ytterbium Content (in moles) Contained in the Grain Boundary for Samples 982, 1145A, 1145B and 1374D

Sample/ % Beta in the Starting Silicon Nitride Powder	Weight % alpha SiAlON	Formula for Alpha SiAlON	Moles of Yb in the Grain Boundary
1145A [6%]	37.7 %	$Yb_{0.35}Si_{10.01}Al_{1.98}O_{0.93}N_{15.07}$	0.0282
1145B [2%]	42.7 %	$Yb_{0.32}Si_{10.16}Al_{1.85}O_{0.88}N_{15.11}$	0.0277
982 [1.5%]	47.1 %	$Yb_{0.32}Si_{10.38}Al_{1.62}O_{0.87}N_{15.13}$	0.0263
1374D [0%]	62.7 %	$Yb_{0.29}Si_{10.48}Al_{1.52}O_{0.66}N_{15.34}$	0.0217

The formula for alpha SiAlON phase is $Yb_xSi_{12-(m+n)}Al_{(m+n)}O_nN_{16-n}$. The values of "x" and "z" are calculated from the lattice parameters measurements using the following formula: a=7.75+0.139x and c=5.62+0.153x, units are in angstroms. Equations are from Z.Shen, T. Ekstrom, and M. Nygren, Ytterbium-Stabilized α-sialon ceramics, J. Phys. D: Appl. Phys. 29 (1998). The value of "m" is equal to three times the value of "x". The value of "n" is estimated from calculations based upon the overall composition of the alpha SiAlON phase, the phase density of the alpha SiAlON phase, the sintered density of the alpha SiAlON phase, the "z" value, and the beta SiAlON content from the x-ray diffraction results. These calculations are as described as follows: a=7.60442+0.03z and c=2.90751+0.027z.

Referring to the results set forth in Table 13 and Table 14, in its broader aspects it is apparent that there exists a relationship between the content of beta silicon nitride in the silicon nitride starting powder and each one of the following: the amount of alpha SiAlON phase that is present in the alpha-beta SiAlON ceramic material, the composition of

~~the overall alpha-beta SiAlON ceramic material including the composition of the alpha SiAlON phase and the composition of the beta SiAlON phase, and the composition of the grain boundary including the rare earth content (e.g. ytterbium) in the grain boundary.~~

~~In regard to the alpha SiAlON content of the alpha-beta SiAlON ceramic material, the results show a continual increase in the alpha SiAlON phase content in response to a decrease in the beta content of the silicon nitride starting powder. The increase in the alpha SiAlON phase content becomes more dramatic as the beta content moves closer toward the 0 weight percent level as is especially shown by the increase of about 5 weight percent in the alpha SiAlON phase (from 42.7 weight percent to 47.1 weight percent) as the beta content decreases from 2 weight percent to 1.5 weight percent, and by the increase of about 15 weight percent in the alpha SiAlON phase (from 47.1 weight percent to 62.7 weight percent) as the beta content decreases from 1.5 weight percent to 0 weight percent.~~

~~In regard to the rare earth content in the alpha SiAlON phase, the results show a continual decrease in the rare earth content in the alpha SiAlON phase in response to a decrease in the beta content of the silicon nitride starting powder. The increase in the alpha SiAlON phase content becomes more dramatic as the beta content moves closer toward the 0% level as is especially shown by the decrease of 0.32 moles to 0.29 moles (about a 9.4 percent decrease) of ytterbium in the alpha SiAlON phase as the beta content decreases from 1.5 weight percent to 0 weight percent of the starting silicon nitride powder.~~

~~It can also be appreciated that the contents of the other elements in the alpha SiAlON phase change in response to the beta content of the silicon nitride starting powder. In response to a decrease in the beta content of the silicon nitride starting powder, the silicon and nitrogen contents increase and the aluminum and oxygen contents decrease.~~

~~In regard to the rare earth (i.e., ytterbium) content in the grain boundary, the results show a continual decrease in the rare earth content in the grain boundary in response to a decrease in the beta content of the silicon nitride starting powder. The decrease in the rare earth content becomes more dramatic as the beta content moves closer toward the 0% level. This is especially shown by the decrease of 17.5 percent in the mole content of the ytterbium~~

~~in the grain boundary as the beta content decreases from 1.5 weight percent to 0 weight percent.~~

~~It is also the case that the content of beta silicon nitride in the silicon nitride starting powder impacts the beta SiAlON phase wherein the starting silicon nitride powder that had no beta silicon nitride formed a beta SiAlON phase with a higher "z" value. In this regard, the "z" value of the beta SiAlON phase that was formed from a silicon nitride starting powder that did not have any beta phase was 0.542, which was 11.3 percent greater than the "z" value of a beta SiAlON phase formed from a starting silicon nitride powder that had a 2 weight percent beta content.~~

~~It can thus be seen that the content of beta silicon nitride has an impact on aspects that influence properties of the alpha-beta SiAlON ceramic, and hence, impact the performance of the alpha-beta SiAlON ceramic product as, for example, a cutting tool. More specifically, these changes affect the thermal conductivity, thermal expansion and Young's Modulus of the ceramic, and these properties influence tool performance.~~